Czech University of Life Sciences Prague

Faculty of Economics and Management

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Bachelor Thesis

Analysis of Cocoa Production

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BACHELOR THESIS ASSIGNMENT

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Business Administration

Thesis title

Analysis of Cocoa Production

Objectives of thesis

The objective of the thesis is the evaluation how sustainable and how costly is the production of cacao, especially in countries that are the biggest producers (Cote d'lvoire, Ghana, Indonesia, Nigeria, Ecuador).

Methodology

• SWOT analysis about the production of cacao and the analysis of two beans categories "Cacao fine aroma" and "Ordinary or Bulk".

• Financial analysis, calculations and basic statistical methods.

The proposed extent of the thesis

40 – 60 pages

Keywords

Cocoa, Harvest Ecuador, Cocolate, Costs, Sustainability

Recommended information sources

Afolayan, O. S. A. (n.d.). COCOA PRODUCTION PATTERN IN NIGERIA: THE MISSING LINK IN REGIONAL AGRO-ECONOMIC DEVELOPMENT (1st ed.). https://doi.org/10.30892/auog.301110-815

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Prague on 15. 03. 2024

Declaration

I declare that I have worked on my bachelor thesis titled "Analysis of Cocoa Production" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on March 15th, 2024 _____

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Analysis of Cocoa Production

Abstract

This bachelor thesis mainly analyzes the sustainability and how costly is cocoa production in the five countries that were the main producers of it between 2021 and 2022; which consists of: Cote d'Ivoire, Ghana, Nigeria, Indonesia, and Ecuador. To make this analysis possible, in the practical part, three different tools to have a clear and complete idea about the situation of the countries and the categories of cocoa that influence this research. In the first place, is the usage of SWOT analysis, which is going to be applied according to the cocoa production, and the two categories of caca (ordinary or bulk and fino aroma); in second place, there is the calculation of cocoa self-sufficiency according to the general production of cocoa in each country known for being the main producers of this product. Third place, there is a financial analysis taking into account one company of each country that belongs to the group of the main cocoa producers; allowing an understanding of how sustainable and costly the production of cocoa is.

Keywords: SWOT, Food Self-sufficiency (FSS), Financial Analysis, Self-sufficiency ratio (SSR), Theobroma cacao, CCN-51, cacao fino aroma, Domestic consumption, Liquidity, Current ratio, Golden Tree, FTN Cocoa Processors, Cost of production.

Analýza produkce kakaa

Abstrakt

Touto bakalářskou prací analyzuji hlavně udržitelnost a náklady na produkci kakaa v pěti zemích, které byly hlavními producenty mezi lety 2021 a 2022; mezi něž patřily: Pobřeží Slonoviny, Ghana, Nigérie, Indonésie a Ekvádor. K provedení této analýzy bylo zapotřebí 3 různých nástrojů v praktické části, k tomu aby jsme měli jasny a úplný pohled na situaci těchto zemí a v kategoriích kakaa, které ovlivňuje tento výzkum. Na prvním místě využití SWOT analýzy, kterou využijeme s ohledem na produkci kakaa (Obyčejné, sypké nebo fino aroma); na druhem místě, máme kalkulaci kakaové soběstačnosti dle běžné produkce v každé námi zmíněnými zeměmi. Na třetím místě je finanční analýza zohledňující jednu společnost z každé země, která patří do skupiny hlavních producentů kakaa; umožňuje pochopit, jak udržitelná a nákladná je produkce kakaa

Klíčová slova: SWOT, Potravinová soběstačnost (FSS), Finanční analýza, Poměr soběstačnosti (SSR), Kakao Theobroma, CCN-51, aroma cacao fino, Domácí spotřeba, Likvidita, Aktuální poměr, Zlatý strom, FTN Kakaové procesory, Výrobní náklady

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1. Contents

2. Introduction

In the following thesis is possible to observe the importance of cocoa production and how are their influence on the economy of the five biggest producers of this commodity from 2021 to 2022. The question I asked myself to make this investigation is the following: To what extent the production of cocoa is sustainable and how costly it is? Due to legal terms, it is not possible to acquire the income statements from companies that are currently producing cocoa so, as a result of the lack of possibility to make a quantitative analysis to be more accurate about the costs of production of cocoa, this analysis will be provided qualitatively, including all the costs that have to be considered during the production of this commodity and giving a deep explanation about each of them with an example of a developed country that will help to compare with the countries that are producers but are undeveloped. It is commonly known how famous is the cocoa industry around the world, as we are talking about a product that has been in the market for a long time ago because it is a product that can be applied in different areas such as medicine, cosmetics, decoration, beverages, or food production. This research will briefly demonstrate the significant topics about cocoa such as its origin, categories, and growing process. Also, it will be possible to observe its sustainability by employing SWOT analysis and not only in a general way, as it presents two categories of cocoa that present different production processes. Moreover, it presents the self-sufficiency of cocoa depending on the country that produces it and has an interpretation of its calculation to understand the purpose of production from the countries that are known as the main producers, in case they are focused on export or domestic consumption, having a clear idea that being the producers doesn't mean that are the same main exporters of cocoa. In addition, as mentioned before, there are presents all the factors that determine the costs of production of cocoa that producers have to consider and it gives an analysis of the liquidity of one company from each country, which will help as an example for this investigation to make a general comparison of which country have better liquidity, it means debt management and margin of safety. In addition, as mentioned before, there are presented all the factors that determine the costs of production of cocoa that producers have to consider and it's given an analysis of liquidity of two companies, one from Nigeria and the other from Ghana, that will help as an example for this investigation to make a general comparison of which country have better liquidity, it means debt management and margin of safety. In this case, due to lack of information about the other countries (Ecuador, Indonesia, and Cote d voire), the two companies will help as an extra example for this analysis.

3. Objectives and Methodology

1.1 Objectives

The objective of the thesis is to evaluate how sustainable and costly is the production of cocoa, especially in countries that are the biggest producers (Cote d'Ivoire, Ghana, Indonesia, Nigeria, Ecuador).

1.2 Methodology

SWOT

In the first place, the method used to make this investigation consists of the SWOT analysis. This is considered a planning tool in which each letter represents important aspects that are involved in a company or organization; This acronym is formed by the following elements: '**S**' for strengths, '**W**' for weaknesses, '**O**' for opportunities, and '**T**' for threats.
The purpose of each element consists on:

- ***Strengths***: Tangible and intangible attributes that make an organization have an advantage over others.
- ***Weaknesses***: Internal factors within an organization that have to improve or develop to not affect their desired goal.
- ***Opportunities***: External factors that are presented in the environment and can be useful for the organization to exist and develop.
- ***Threats***: External factors that can be harmful to the organization and can risk its mission or operation.

Moreover, the usage of this tool presents some advantages and disadvantages; in case of advantages, are the following:

- It's really helpful for a better understanding of the research.
- It is helpful for the improvement of strategic thinking
- Increase a better understanding of business opportunities and how to use them efficiently
- Allow the possibility to focus on strengths and create new opportunities
- It has an easy access

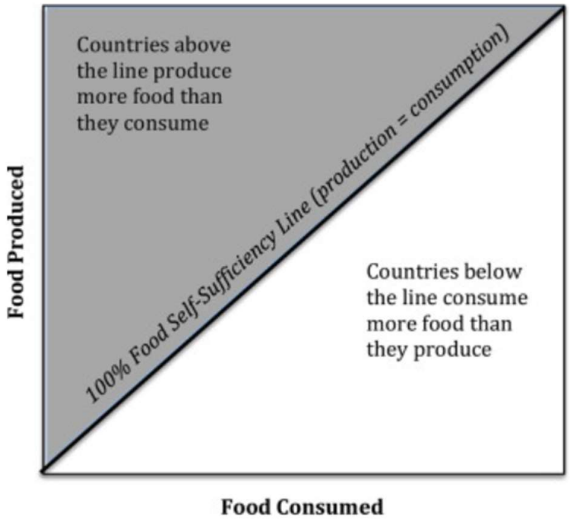
In case of the disadvantages are:

- In case of having too much information, there is the possibility of facing a 'paralysis by analysis', which consists of experiencing too much fear of making a decision and, due to it, causing a waste of time.
- It is possible to use it with insufficient data, so it can create wrong results and confusion.
- To acquire effective results, it is necessary to dedicate time to repetition
- Due to its lack of detailed structure, it is possible to miss some elements that can contribute positively to the investigation.
- The data that is used in this tool is mostly based on assumption, so it is possible to have inaccuracy information.

After a short analysis of the importance of SWOT; it will be applied to concrete the production of cocoa, but focus specially on two different categories of cocoa beans, which consist of: cocoa fino aroma' and 'Ordinary or Bulk', taking into account their production cycle

Food Self Sufficiency

Furthermore, there is the presence of an important statistical method, 'food self-sufficiency' or 'FSS', taking into account that statistical methods consist of a group of mathematical formulas, techniques, or models that are applied for a statistical analysis, which is applied for the extraction of significant information from research data (*Nature, 2023, December 14*).



Picture 1Food Self-Sufficiency Source: (Clapp, 2015a.)

Talking about ‘food self-sufficiency’, (FAO, 1999) defines it as: 'The concept of food self-sufficiency is generally taken to mean the extent to which a country can satisfy its food needs from its domestic production’, in other words, is the ability of a country to produce enough food in such point that they don’t experience the necessity of import.

In the case of Picture 1, the diagonal line represents complete food self-sufficiency indicating that the food produced is equally consumed; in case the country or region is above the diagonal line, it means that they produce more food than they consume, being export the solution for the oversupply of food presented, otherwise, when is below the diagonal line, it means that consume more than they produced, and import is the solution to fulfill the demand of food required as they are not producing enough to satisfy themselves, it means food deficit.

There are also some advantages and disadvantages of food self-sufficiency, which are briefly explained below:

Advantages:

- The independence of other countries; one example occurred during the pandemic of COVID-19 in 2020, as many countries could satisfy and protect themselves with this self-sufficiency. These countries are China, Russia, the United States, into others (Quora, 2020).
- Create some economic savings as you don't see the necessity to import a product or commodity, so it helps to save a lot of money.
- In the case of consuming the product of your country, it can be beneficial for its development, generating more opportunities and more employment, improving the life quality of everyone as a consequence.

Disadvantages:

- Talking about growing, harvesting crops, and maintaining the infrastructure requires a lot of time and resources which, depending on the current situation of the country, can be time-consuming and difficult to maintain; as an example, is possible to take Ecuador, because of their current situation of bad security and corruption they have to focus principally on recover the well-being of the country, as it is mention in (REUTERS, 2024) ‘Ecuador is reeling from a fresh wave of violence that has shaken the South American nation’, and this objective requires a significant amount of money considering the cost of weapons, which is an investment of $800 million.

- It can be also a negative influence for local businesses to export to other countries due to the approach that self-sufficiency has.
- It requires an equal investment as long as it is possible across all sectors of its economy or it can be harmful to the economy in the sectors that don't count with enough investments.

To know about food self-sufficiency, it will be the usage of the 'Self-sufficiency ratio' or 'SSR', which consists of the percentage of food consumed that is produced (NIH, 2019). To make this calculation, it will be applying the formula below:

$$Wi = \frac{Pi}{Zi}$$

Formula 1 Self Sufficiency ratio

Where:

W_i: is the food self-sufficiency ratio for product i.

P_i: This is the production volume of product I and can be expressed into 'tons, country, year'.

Z_i: This is the domestic supply quantity of product I and can be expressed into 'tons, country, year'.

The data used for this calculation will be obtained from 'FAOSTAT', which consists of The Food and Agriculture Organization (FAO), which is a specialized agency of the United Nations, whose purpose is to defeat hunger (FAO, 2024).

After an explanation of Food self-sufficiency and how it will be calculated, it is worth emphasizing its usage in this investigation. The following method will be applied to find out the self-sufficiency of cocoa in the five biggest producers of cocoa from 2021 to 2022, creating the possibility to compare the self-sufficiency of this commodity between these countries with the use of data from the Food and Agriculture Organization.

Financial Analysis

As a Third resource for my investigation, 'financial analysis' is going to be implemented as it consists of a process that will allow an evaluation of the financial situation of different companies, one located in Ghana and the other one in Nigeria. The information provided about how costly the production of cocoa will be given qualitatively and the quantitative information provided in this analysis is the liquidation of each company to find out which of these

companies producing cocoa have the best liquidity, it means, better management with their debt and safety margin.

'Financial analysis' is the process of analyzing financial statements and other relevant information or data that can contribute to finding out the financial health and performance of an organization (qlik, 2024). The importance of this process is because it is useful to recognize the strengths and weaknesses that an organization possesses, moreover, in the case of companies, this process is helpful for them to create their future strategies; taking into account the importance of the stability in a company considering the investors, lender, and creditors to show them the ability to pay back debts, loans or guarantee their investment to make them feel secure.

There is the presence of some advantages of this tool, which are the following:

- The information provided by this process helps make decisions about investments or extending credit.
- It is possible to find out the sectors of a company that have good performance and the ones that need to improve.
- Due to the knowledge acquired of the strengths and weaknesses that a company has; it is useful to analyze which strategies can be applied to develop strengths and reduce the weaknesses.
- It is beneficial for creating plans and budgets, as a company has the necessary information for forecasting their performance in the future.
- In the case of investors, this tool is helpful for them to compare companies and make decisions about which one is a better option due to the possibility of also predicting their future.

As in any process, there are some disadvantages such as:

- As a consequence of basing the assumptions from past data, the assumptions made, consider that the past trends won't change.
- This process does not take into account the external factors that can be harmful to the financial performance.
- Despite the information provided, it only shows results but not the reasons why the financial status is increasing or decreasing, so in case there is a necessity for a better understating of the situation that influences the results, another should be made another analysis.

As it was mentioned before, the financial statement analysis of the companies; this analysis consists of checking the financial statements to understand their financial performance, positions, and cash flows, and in case of the insights, profitability, solvency, and operational efficiency. The advantages and disadvantages of the financial statements are the same as the financial analysis in general that were presented before as it is considered as a type of financial analysis and a key component of it.

Additionally, the financial statements are divided into 4 different types: Income statement, Balance sheet, cash flow statement, and statement of shareholders equity. The income statement provides information about the revenues, expenses, and net income or loss during a certain period, the balance sheet talks about the enterprise assets, liabilities, and equity from shareholders, and the cash flow statement presents the inflows and outflows of the cash and the last but not less important, is the statement of shareholders equity, which include the income, dividends, equity transactions.

The balance sheet presented will be used to calculate their liquidity ratio, which is one of the three types of ratio analysis (liquidity, solvency, and profitability ratio). To make a liquidity ratio analysis is going to be considered the three types of liquidity ratios, which their importance is due to determine if the companies presented can pay their bills and continue with their normal operations; the importance is because in case the company has insufficient liquidity is not able to make payments for their employees or supplier, or to their operating expenses (*Finally learn, 2023*). There are three types of ratios in liquidity which are the following:

- **Current ratio**: This is the most common one from the liquidity ratio. This type is the most used and is also known as liquidity ratio or working capital ratio, and presents the following formula:

$$\frac{Current\ assets}{current\ liabilities}$$

Formula 2 Current Ratio

For its interpretation is necessary to consider that the higher current ratio is, represents more liquidity and less risk; but in case the value is too high, it represents the inefficient use of resources from the company side (*Finally learn, 2023*).

- **Quick ratio**: It's known for being a really strict measure of liquidity in comparison with the current ratio and the formula used for it is the following:

$$\frac{Cash + Receivables + Marketable\ securities}{Current\ liabilities}$$

Formula 3 Quick Ratio

To make possible the interpretation of this ratio, we take away the inventory and the prepaid items that are supposed to be located in the numerator but as this ratio is known to be stricter, these variables affect negatively the liquidity of the current assets. And to read it is the same as the current ratio as the higher quick ratio is, represents more liquidity and less risk; but in case the value is too high, it represents the inefficient use of resources from the company side (*Finally learn, 2023*).

- **Cash ratio**: In comparison with the current and quick ratios the cash ratio is known as the strictest one and has the following formula for its calculation:

$$\frac{Cash + Marketable\ securities}{Current\ liabilities}$$

Formula 4 Cash Ratio

In the case of cash ratio, it presents more realistic values about liquidity as it focuses only on true assets and, as it was presented in quick and current ratio, it is interpreted taking into account that the higher cash ratio is, represents more liquidity and less risk; but in case the value is too high, it represents the inefficient use of resources from the company side (*Finally learn, 2023*)

4. Literature Review

1.3 History of Cocoa

First of all, it is presented briefly the ‘history of cacao’. ‘theobroma cacao', known mostly by the name of 'cacao', came from the tropical evergreen tree from the family of ‘Malvaceae’; its name ‘Cacao’ came from the Olmec word ‘kakawa’ and ‘theobroma’ is Greek, with the meaning of ‘food of the gods’. The Olmecs came from the southern part of Mexico, and they spread cacao to the Mayans and the Aztecs, who later converted this bean into a beverage that could be flavored with vanilla, chili peppers, and honey.

On the other hand, thanks to an expedition made by a group of archeologists it was possible to prove that cacao was first domesticated in Ecuador; everything starts with new research published in ‘Communications Biology’, which shows the domestication of cacao around 3,600 years ago, and not specifically in Mesoamerica. During this investigation of cacao domestication, they took 200 cacao plants to analyze their genomes, after this process, a genetic differentiation appeared; having in mind that a domesticated plant is changed during the time to develop the size and taste, means that their genes, in contrast of the wild relatives, don’t have as much variety. An example of early domestication is 'Criollo’ (*the most common variety of cacao*) cultivated by Mayas; the domestication of cacao could be presented between 2,400 and 11,000 years ago, but Criollo appeared as being the first domesticated in Ecuador and not in Central America, demonstrated on pieces of stone and ceramic, found from Mayo-Chinchipe (*the oldest culture from the western amazon region*) that are 5,300 years old, it means, 1,700 years earlier than the evidence that suggests the cacao domestication was firstly in Mesoamerica, leading to the hypothesis that cacao was traded to Mesoamerica.

Moreover, cacao grows in the forest with a height of 20 to 40 feet. The cacao is mature enough to give fruits after four years of waiting in an elongated pod form, whose color can range from yellow to a deep purple; it can give approximately 70 fruits annually.

However, it is also important to underline the difference between ‘cacao’ and ‘cocoa’; Cocoa came from the Spanish word cacao, and due to it, these words are mostly confused. On the other hand, cacao is used for less-processed products and roasted cacao nibs, but in the case of cocoa, this term refers to processed products such as cocoa powder, hot cocoa, or cocoa butter

1.4 Growing Process of Cocoa and Sustainability

The growing process of this interesting commodity is divided into four steps:

- **Growing**

In this step it is important to consider the protection that trees require from the sun or wind and fertilize the soil, taking into account any sign of disease or distress; as a consequence of good care, most of the cacao trees can yield pods by the fourth or fifth year and continue like this during 30 years more approximately. A pod can contain from 30 to 40 beans, considering 30 pods per tree, and to make one pound of coca, its needed 400 dried beans.

- **Harvesting**

In the majority of countries, harvesting (*the process of collecting fruits that are mature enough*) is divided into two parts: the main harvest and a smaller harvest. To reach the pods and cut them without creating any damage to the soft bark of the trees, the cacao farmers use long-handled steel, and after that process, they can collect the pods in baskets.

- **Fermentation and drying**

Is the post-harvesting process that makes a significant impact on the quality of the cacao, due to the influence it has on its taste too. After the beans are removed from the pods by the farmers, they are packed into boxes, then, they are covered in bananas' leaves for 3 or 7 days for fermentation produced by the layer of pulp that surrounds them, enhancing the flavor that cacao. Finally, the beans are dried for several days being exposed to the sun.

- **Selling, transporting, and shipping**

Only the dried beans are taken for being packed into sacks so the farmer can sell the product at a buying station. In case the buyer approves the product and buys it, they transport them to an exporting company where the sacks are inspected, then take them to burlap, sisal, or plastic bags, ten, to be stored, waiting to be shipped to a manufacturer, they are located in the exporter's warehouse.

Another factor that is important to explain, is the sustainability of cacao. When there is a reference to sustainability in this case, we are talking about a process made considering the well-being in an ecological, human, and economic area. The issues generated by producing cacao are mainly divided into five that can be harmful to the future of cacao production:

- The first one is about the living situation of the farmers who cultivate it, as they are exposed to experience high percentage of poverty and cruel conditions, and they also experience discrimination for their situation. After a hard process of cultivation, farmers just receive approximately 6% of the final value (*Fairtrade, 2023*), which means

converting the cacao into chocolate bars. Farmers also experience the consequence of the climate crisis generated from this production as they are exposed to the weather that is constantly changing and this can be an influence on their health too, but their health is principally exposed to the different chemicals used to avoid diseases and pests. As a result of this negative impact that is easily proved, the future generations are looking to avoid farming and decide for careers outside these areas and this is a significant factor that can end with the production of cacao because of the lack of farmers. In addition, to have a better understanding of their level of poverty, it's worth saying that farmers receive about $1 per day for their work.

- The second case is about the low productivity of cacao production. This situation is generated as a result of price fluctuations, how the access of the capital as its limited, and, as it was mentioned before, the health of the farmers.
- In third place, there is the presence of child labor, which can be evidenced principally in Western Africa, and not only child labor, there is also the presence of slavery. The usage of child labor is to maintain their prices competitive and this situation is mostly presented in Ghana with a quantity of 2.1 million children approximately (*Food Empowerment Project, 2023).* The children are exposed to harsh situations to support their families and they end in that situations as a result of lies from the traffickers or even from the farm owners as they offer more than they are going to pay them and without warning the children about the situations of unhealthy environment and denying them the opportunity to continue with their studies and as a consequence, they are not able to improve in any sense. Through uncovering journalists who were investigating this situation in some farms, it was possible to confirm a selling price per child of $34 (*Food Empowerment Project, 2023)*. After the children are aside from their family, in the best case they can see them again after years but mostly they don't see them again. It is supposed that their age is between 12 and 16, but these journalists were able to find children even 5 years old and are forced to work 14 hours a day approximately.
- In fourth place, there is deforestation, which is caused because of the usage of protected areas to increase their production and in some tropical forests, as they are growing in these parts, they prefer to continue growing new trees instead of reusing the land that was used before.

- Last but not least important, is climate change, taking into account that cacao is a rain-fed crop and as a result of deforestation made, this causes a negative influence on the weather patterns due to the carbon emissions. Talking about the change in weather patterns, it means that the crops are exposed to high temperatures and droughts that caused a few productions of cacao, so they decide to continue growing cacao in new lands creating a toxic cycle

1.5 Types of Cocoa

There are also different types of cacaos divided into three groups: Forastero, criollo, and trinitario.

- ***Forastero***: used for commercial production
- ***Criollo***: they are known because of their weakness as the probability of acquiring the disease is high, and due to it, they are not widely grown.
- ***Trinitario***: This consists the result of a combination of forastero and criollo, which is known for being perfect for creating high-quality dark chocolate due to its flavorful bean.

Taking into account the quality of cacao, there are two bean categories 'ordinary or bulk' and 'Fino aroma'. Something interesting about this topic is that 'Fino aroma' or 'Fine flavor' belongs to 5% of the global cacao supply and the majority of it is located in Ecuador. The other 95% of cacao corresponds to the 'bulk' category, which includes some primary varieties such as 'Amelonado', which is planted mostly in West Africa, and 'CCN-51', known due to the lack of flavor provided, on the other hand, 'CCN-51', has great characteristics of tolerance to disease and can adapt easily to different edaphoclimatic conditions (*edaphoclimatic due to climate and edaphology, which include the relationship of plants and soil and cultivation practices*). In addition to this explanation, currently, the quality of the cacao is not as important as the quantity that can be produced, and the difference is presented between cacao 'Fino Aroma' and 'CCN-51', because 'Fino aroma' is known for the high quality, in contrast, the CCN-51 gives the possibility of being produced in more quantities because of its qualities like the ability to adapt into different environments, giving a huge advantage for the manufacturers

1.6 Economies of countries as major cocoa producers

Having the information presented before, it is possible to talk about the main producers of it between 2021 and 2022: Cote d'Ivoire, Ghana, Indonesia, Nigeria, and Ecuador.

- Cote d'Ivoire count with a quantity of 2,200,00 tons of cacao beans annually, of which, from the quantity produced around the world, 38% belong to Cote d'Ivoire; making the economy of this country dependent on cacao prices and their export revenue, came mainly from the export of cacao beans (*WorldAtlas, 2022*).
- In second place, is the Republic of Ghana, with a quantity produced annually of 800,000 tons of cacao. Cacao in this country, plays a significant role in the agricultural sector, as their accounting is one-third of the export revenue. Another factor that influences this production, is the climatic conditions, that boost their cultivation by more than 20% in comparison with the last growing season. Moreover, Ghana is recognized not only because of the quantity of cacao produced, they are also because of the high quality it supplies, giving them the chance to command a premium price of cacao in the market (*WorldAtlas, 2022*).
- Indonesia, with an annual quantity produced of 739,483 cacao. A similarity that has with Ghana, is the crucial role that cacao plays in the agricultural sector, as it is significant for their export revenue; this is a result of a massive growth experience during the last years with 1.5 million hectares of cacao plantations, where 75% of it belong to the island of Sulawesi. The main countries that import cacao from Indonesia are the United States, Malaysia, and Singapore (*WorldAtlas, 2022*).
- In the fourth place, there is the Federal Republic of Nigeria, with a production of cacao of 340,163 tons annually. Even though Nigeria is mostly known for its role in cacao, its world output of cacao declined due to its new investment in the oil sector. Nigeria with the production of cacao, during 2010, accounted for only 0.3% of their total agricultural GDP (*WorldAtlas, 2022*).
- Ecuador, with a cacao beans production quantity of 327,903 tons, accounts for 4% of the world's cacao production, and cacao plays a significant role in their economy and history (*WorldAtlas, 2022*). Ecuador is recognized for the cacao category 'Fino aroma' because it can only be cultivated in this country, as a consequence, the most expensive cacao in the world belongs to Ecuador with the brand 'TOAK' that provides chocolate bars with a price over 300 dollars. What makes this country distinguished from the rest, talking about cacao, is the quality they offer to the consumers, due to the high quality, Ecuadorian cacao is known as 'Cacao Arriba', considering 'Arriba' as the district where it is produced, or known commonly as the province of 'Los Rios'

5. Practical Part

1.7 SWOT Analysis

To start a SWOT analysis will be applied to the general production of cocoa band the two categories of beans 'Cocoa fino aroma and Ordinary or bulk'. This analysis has the purpose of indicating how sustainable is the production of cacao in our investigation.

SWOT analysis 'Cocoa Production'

Strengths

- This production can be a significant benefit for the farmers of cocoa, as they can receive the price, they deserve due to the direct trade; this action is the consequence of a stable supply that leads to an economic improvement, counting with a product with high-quality.
- In case the cocoa is produced from an ethical source, the consumers are willing to consume it even if it has a high price; and this leads to a good impact on the farmer's profit and can grow their business. As a consequence, there is also a growth in employment rate, which benefits the country that is experiencing this situation.
- Cocoa is a product that is known for its plenty of usages, such as chocolates, butter, as medicine, or in the cosmetics area. Its plenty of usage brings the possibility of increasing the revenue streams and products offered.
- Their production can be done with a sustainable process, and this can be done with the help of natural fertilizers, rotation of the crops, and implementation of different techniques to make possible water conservation. These practices are beneficial to improve long-term sustainability and protect the environment.

Weaknesses

- A big disadvantage of producing cocoa, is their high dependency on weather and this factor is unpredictable, even if technology has been improving over time, weather is something that people can have a prediction but it doesn't mean that it will be completely accurate; this factor also has a significant impact on the crop yields of cocoa such as scarcity of soil water.
- As we are talking about a product that has to be cultivated, it needs a lot of investment in the land and all that is needed for its welfare, the equipment, and the labor needed. Moreover, developing countries, don't have the same access to financial options as in

developed countries; as a consequence, farmers have a low possibility to expand their operations or improve them.

- In case the farmers who will work the yields don't know enough to manage the crops, can affect the quality of cocoa beans.
- The prices of cocoa are constantly changing due to the change in weather, the political situation of the country where is growing, the diseases presented, or even some cases of pests. As a result, the constant changing of prices impacts the profitability of farmers.

Opportunities

- Taking advantage of that nowadays the demand for natural and organic products is increasing; farmers can continue this trend by creating organic methods and selling their organic products to big chocolate companies.
- Farmers can increase their profits by producing value-added products with cocoa, such as chocolate bars or cocoa powder.
- The production of cocoa can be a great opportunity to promote the tourism area, giving a chance for farmers to teach about the product they supply and a unique experience that will let them have extra revenue.
- The practice of cocoa farming has the opportunity to improve, due to the exponential advances in technology; this situation can also increase the quality of cocoa crops and higher yields.

Threats

- The cocoa crops are exposed to experience negative impacts as a result of climate change. Some situations that can impact significantly are such as natural disasters or droughts, putting at risk the situations of the production and its yields.
- The plants of cocoa are susceptible to being affected by diseases or even pests in case the treatment provided is not done as it's supposed to be; leading to a low quality in cocoa and a reduction in crop yields in some cases.
- The industry has been known for a long time ago, which means that its competence is relatively high and makes it more difficult for the new entrants in the market to develop and gain recognition.
- As a consequence of its price volatility, there can be changes in the supply and demand of the product, which means, there is going to be an impact in the economic area.

SWOT analysis 'Cocoa Fino Aroma'

Strengths

- This type of cocoa is distinguished for obtaining a fresh and delicate taste that can be a good opportunity for those who appreciate chocolate and have a deep knowledge about it.
- After giving the adequate process of cultivation, it is possible to highlight their high quality more than any other cocoa.
- Able to compete in the international market due to its approval and help by the International Cocoa Organization (ICCO), as they are interested in promoting this type of cocoa, they increase the percentage required to consider cocoa with high quality.
- As it is produced with special care, it is grown with sustainable agroforestry practices to improve its growth and avoid climate change or deforestation. This growth is possible because, as it was mentioned before, it can only be produced in a few places and requires a lot of attention.

Weaknesses

- Its probability of being extinct is high in case there is no support due to its growth in specific regions.
- As it consists of high-quality cocoa, it means that not everyone can produce it and requires a lot of support and the people who produce it have a high percentage of risk in their profit as the consumption of this cocoa is mostly by experts of the topic, it means people as tasters of cocoa for example.
- Prices are exclusive and not everyone can afford it, due to eat prefer to buy cheaper cocoa which taste cannot be as good as cocoa fino aroma but its consumption is common and people's palates are custom to it, and it is possible to say that is a taste acquired over time.

Opportunities

- Is considered the best option for people who are experts in cocoa and
- Have an important role and position in the market as it can be considered a luxury cocoa due to its characteristics.
- As it is a cocoa that is relatively new, it is a great opportunity to make the country, in this case, Ecuador, known and play an important role in the market of cocoa and also help to improve in the tourism area as people are curious to meet the country and

especially the place that produces the most expensive chocolate in the world. It can also be a great opportunity for tourists to learn more about cocoa

Threats

- Despite they are recognized for their taste and smell, they have a big competence in the market, and due to it, their demand corresponds just to 5%.
- Even if they are currently in the market, as a consequence of their strict demand to be cultivated, it is extremely difficult to produce in big amounts for the market, considering that they cannot be produced in any country.
- If the demand they have is low, they can be even extinct as the number of people producing it is really low due to the high cost that it takes to produce this type of cocoa, so the producers have to assume the risks of it.

SWOT analysis 'Ordinary or Bulk'

Strengths

- This type is known also for its strength and its ability to adapt to different types of yield, making its production easier for producers and growth easier for farmers.
- Its cultivation is unchallenging as it is possible to apply the usage of traditional techniques that were mentioned below in more detail (growing, harvesting, fermentation, drying and finally selling).
- As was mentioned, as a result of being easy to produce, it means that is possible to produce in big amounts to fulfill the needs and wants of the customers, and also the quantity is more than enough to not be out of the market, including the international market.

Weaknesses

- This type of cocoa is known for being tasteless, in other words, this cocoa is known for being poor from an organoleptic point of view, which consists of a product that has the sensory attributes that call the attention of the customer (*Certified laboratories, 2023*).
- As it uses traditional cultivation, it also means that especially the process of cultivating more trees instead of reusing the land, and this process is the principal cause of deforestation.

- As a consequence of the high demand for cocoa, this is not justification but is the reason for an increase in the cases of child labor to reduce the cost of production as the producers need a lot of people to take care of and manage the crops.

Opportunities

- Their high resistance to changes in weather patterns lets them tolerate these changes positively and much stronger than other crops so this is an advantage for this type of cocoa and lets the producers of it have a low percentage of risk of losing their crops and this leads to a loose in their profits.
- It is easier to gain profit from its production because of the high demand for this product taking into account the international market too.
- Have a good position in the market as cocoa can be used in different areas and for different products. This commodity can be applied in anything you can imagine even if their appliance is completely the opposite such as cosmetics or for medical purposes.

Threats

- Their competence that counts with better quality, such as cocoa fino aroma, is a huge threat for them because they will not be the first thought of consumption for the people who know cocoa and the importance of taste and smell.
- As a consequence of its bad reputation in its influence on climate change or the economic situation that exposed the farmers who produce it, it is possible to stop its production slowly in case there is no usage of sustainable process to produce it and as time passes, the new generations care more about the environment and the welfare of human being, it Is possible that prefer the consumption of other commodities to replace the consumption to stop their negative effects in the environment and the people who work hard to produce it

1.8 Cost of Production

Talking about how costly it is, there is a list of operating costs that are the daily expenses used for being aware and making good decisions to have positive profitability and growth. The following operating costs are shown below and the examples given to have an approximation about prices are taken from a developed country, the United States:

- **Raw material cost**

These costs include the price that is paid for the cocoa beans that will be later used for production. As is not possible to have a specific amount of its cost, its average is approximately $2.500 per metric ton (*FINMODESLAB, 2023*), but it is worth saying that prices change depending on external factors such as the quality of the cocoa or the location of the supplier, but even the season where the cocoa is bought can be an influence in the price too.

There is also a significant difference in factors that can influence the price of cocoa beans and the factors that influence the cost of cocoa beans; case of the price of cocoa beans is determined by the supply and demand of them, considering that high demand, especially from industries such as chocolate and confectionery, create fluctuations in prices, it means the change of prices in a determined market area.

As it is consider as a raw material that can be the base of the majority of products, it's production grew from 2008 to 2020 with the amount of 4.27 to 5.76 million tones, and also let this market break a new record growth in global supply, but its growth was affected between 2021 and 2022 due to the war between Russia and Ukraine as this situation affected the yields because of the trade sanctions that reduce the availability of acquiring fertilizers and its raise of price, were a negative influence for some farmers to obtain their inputs for the production; but this supply deficit was reduced between 2022 and 2023, due to the availability of fertilizers and an improvement in weather conditions e (Mera et al., 2021; Tridge, 2021). Another example of how can costs be affected occurred with the COVID-19 pandemic, and its impact was mainly in the cocoa sector as this commodity is commonly exported for the production of chocolate and it also affected the availability of fertilizers, the obtention of inputs and the labor availability, which also plays an important role in the costs of production of cocoa and will be mention after in a more detail way. In other words, there are external factors such as weather conditions or the current political situation of a country that is producing cocoa that affects its costs. Another important factor that can impact the costs of raw materials is transportation expenses, as cocoa is known for being mainly imported from the countries that can produce it.

- **Labor cost**

In case of labor costs, play an important role in financial sustainability and the average hourly wage that workers receive is approximately $16.13 per hour (*FINMODESLAB, 2023*), and this information is taken as an example from the United States; this situation depends principally on the labor laws of each state as it varies, and also considering the part-time workers and the ones who are full-time employees.

As it is possible to visualize in Picture 5, the value that correspond to farmers in the final sale is about 6.6%, and low incomes are also the reason of many issues that occur in the cocoa farming. In comparison with United States, the World Bank sestablished that the average wage received, causing extreme poverty, is $1.90 per day but in case of Ghana, the workers count with an amount of $0.78 per day, which is understandable to be below the line of extreme poverty (*World Economic Forum, 2020*).

Also, it has to be considered some factors can impact labor costs while the cocoa is processed; first is the number of workers that should be employed considering the stages of producing cocoa, the ones that were shown before, as some stages require more personnel than others like the case of harvesting and manufacturing because in the stage of harvesting requires more manual tasks.

The second factor that can be included, are the workers who, in comparison with others, have better knowledge about the processing plant and are experts in the subjects; this group of workers is also known as machine operators and as they are distinguished from the rest due to their knowledge, it also means that their wage has to be higher and this action creates an increase in the labor costs. The third but not less important factor is the location of the business and the laws that are there too about the local labor as it varies and influences the remuneration of the workers. As mentioned, it Is important to consider the location because the countries that present minimum wage legislation have to tackle higher labor costs; this situation is not presented in some developing countries as they don't even have a minimum wage.

- **Utility cost**

These costs are the major operating ones talking about the businesses that process cocoa as they include utilities such as gas, electricity, and water, among others that are essential to the process of planting.

To have an idea about the amount that corresponds to these costs, we have an example in US dollars, where a mid-sized plant that processes cocoa presents a cost of $15.000 per month approximately (*FINMODESLAB, 2023*); is important to specify this example the size of the plant because the costs depend on the size, the utilities found in the area and the location. Moreover, some options can be considered to reduce some costs by making investments in efficient machinery and equipment; as a result, there's a reduction in the amount of electricity and other utilities used .

Another solution suggested, is taking into account programs of recycling the materials that are involved in the process, and this option is not only helping to save money, it is also helpful to

reduce the environmental impact. What is also important about equipment, is the maintenance given, not only for safety but also plays an important role in reducing costs by working efficiently and managing the consumption of energy.

- **Transportation cost**

Regarding transportation costs, they are involved in the costs of production as they are significant for the transporting of the cocoa beans from the farm to the processing plant; this cost of transporting the beans of cocoa can affect the profit margin of the business. These costs are also known for being the major expense and their variation depends on the distance between the farm and the plant that will be processed these beans.

To have a better picture of it, there is an example taken from recent statistical information of the United States with ranges between $2.50 and $4.00 per mile for a 53ft dry van. Most countries from the West African countries that want to port to the United States have a price per 20-foot container between $1.500 and $3.000 (*FINMODESLAB, 2023*). In other words, the costs of transportation vary depending on the distance and the transport used for it.

On the other hand, some solutions can help to the reduction of costs of transport for businesses, taking into account that this cost is affected by negative external factors such as a rise in the prices of fuel, the change of government regulations or having roads in bad conditions. The first solution recommended is the use of intermodal transportation which consists of a 'system that provides multiple modes of transportation to transport passengers as well as freight, this can be through trucks, railways, ships, and aircraft via land, water, or air' (*MARKETING91, 2020*). The purpose of using this method is to reduce costs by selecting an efficient mode of transportation depending on the length of the journey. The second option that can help to reduce this cost, is the optimization of the supply chain, which as a consequence, can improve the efficiency of transportation due to less lead times, reduced freight handling, or optimizing the routes; this action is not only can impact positively on the transportation costs reduction but can even improve in general terms the profitability of the businesses that process cocoa.

Moreover, in the case of transport and storage of the cocoa, it requires special and specific measures as the weather of some countries can affect their quality as a result of providing humid or hot climates. It is traditional to ship the cocoa beans in sacks made of strong jute fabric and lately, bulk transportsare significant as the cocoa is dumped into some containers; this form of transport is suggested as has important consequences in the trade of cocoa, the loading and unloading of ships (eca, 2024).

- **Maintenance cost**

Talking about maintenance costs it's important to underline the investments that should be made for the equipment that will be used in the future and the infrastructure where it's going to be process the product. In this case, we are talking about machinery, it is significant to give them maintenance frequently to have good results from an efficient operation. Consequently, the costs of maintenance are considered an essential expense to provide the right production process throughout the year. Approximately, these costs have an amount of $150.000 annually, but logically this cost depends on the size of the equipment, the quantity, and the type of equipment used. Also, it is mentioned that 15% of the operating costs belong uniquely to maintenance due to its importance, because in case they are not in good condition this can cause failure and a significant financial loss for the company (*FINMODESLAB, 2023*). As it was mentioned before, machines are the ones who need more maintenance, so here are the main machines that are used for the process of cocoa are the following:

- Chocolate grinder machines: are used for grinding cocoa beans and transferring it into chocolate liquor.
- Chocolate refines machines: it help to refine the chocolate liquor utilizing a reduction of particle size and helps to improve the texture.
- Conching machines: It is used to knead and mix the chocolate liquor to give a better texture and flavor.
- Chocolate coating machine: It is used for coating some items.
- Automatic chocolate tempering machine: As it name mentioned, it is used to temper the chocolate such as heating or cooling to smooth chocolate with a glossy finish.

The importance of these machines is to include them in the cost of production of cocoa as they are the main machines used to have a profitable and good process to success (DuyvisWiener, 2023).

Packaging cost

One essential aspect of costs of production is the packaging, as it's how you are presenting your product to the market and how you will call the attention of the customer, and it's also the representation of the company. This cost has to be analyzed in every detail to have a balance of not having a package that is too expensive or too cheap, as the cost has to be at a standard price that can be reached and attractive to the customers, and creating the opportunity for the companies to achieve a reasonable profit.

To have an approximation of the cost of cocoa for the businesses that process this commodity, count with an average cost between $0.10 to 0.25 American dollars per piece

(*FINMODESLAB, 2023*). The factors that are an influence for these costs are materials, design, and quantity. However, some options allow a reduction in the costs of packaging such as the order in bulk, which consists of putting the packages in order according to the sizes and quantity to have a better experience with the economies of scale; in second place is the minimization of packaging that consists on a reduction of materials usage and a smaller packaging makes the transport cheaper too; in third place is to present a simple design that can still be attractive and unique for the customers but also use basic colors, shapes, and minimal printing or labeling.

What is also recommended to consider, is sustainable packaging, which can help to reduce the negative impact that the production of cocoa causes and is an option to make citizens participate in the consumption of a product that contributes positively to the environment by just consuming it; it is worth to say, that the main problem of packaging is waste that can cause and its presented in big quantities and the companies can take advantage of the current technology that can create a package that can satisfy the customers and can also reduce the negative impact that environment has because of packages (*ResearchGate, 2011*).

- **Marketing and advertising cost**

Marketing and advertising are crucial to make a business be noticed in the market and to make the businesses that process it successful. In this case, measuring the cost depends on how much success the business wants to achieve, taking into account that currently social media is playing a significant role in marketing so it's important to have a digital presence to make this success possible. During 2019, the average cost to produce a piece of social media content for a company is $200 approximately (*FINMODESLAB, 2023*). Furthermore, some marketing channels require investments like radio advertising or print, and a business that processes cocoa might have some marketing channels that fit their budget and can form part of their target audience.

- **Rent/Lease cost**

The rent or lease cost is significant due to the impact that can have on the profitability of a business; to have an idea about the costs of it, we have the United States that shows a cost for industrial properties of $6 per square foot per year, but this cost depends on the location of the property, the type and the size of it (*FINMODESLAB, 2023*). As we are talking about cocoa, the businesses in charge of its process have to consider the amount of space needed, and the scale of production.

As it was mentioned before, location plays an important role in this topic, since costs are higher in urban areas and the more developed ones. Moreover, the owners should consider a location

that is also near the source of cocoa beans or the transportation hubs, as these necessities increase the costs of rent or lease. The second factor that is significant to consider is the length of the contract of the property acquired; in the case of a long-term contract, presents less annual costs in rent, although, despite the property having a low price, the owners have to make sure that the location will not be a problem for their business needs in the future, and one aspect to consider before signing a lease agreement is the flexibility offered.

- **Insurance cost**

Talking about a business, it presents some risks that can affect it and that should be prevented beforehand and to make adequate prevention, it's important to choose the right insurance coverage. As an example, there is the United States that provides insurance for small businesses with a price between $1.281 per year and $107 per month (*FINMODESLAB, 2023*). In the case of the production of cocoa, requires more insurance than commercial insurance; they need product liability, business interruption, and worker's compensation insurance and each of them has their proper policies and costs. It is worth saying that the costs of insurance also depend on the providers and the owners can reduce the costs of insurance by providing a proper plan that prevents the risks.

1.9 Cocoa Self-sufficiency

To calculate cocoa self-sufficiency, there is the usage of the 'Self-sufficiency ratio' or 'SSR'. The first step is collecting the necessary data about cocoa in the countries that are relevant to the investigation of cocoa production.

After collecting all data from FAO STAT, it is filtered and divided into the countries that are the producers, and the key elements to calculate the self-sufficiency ratio, which consists of two elements: the volume of the product and the domestic supply of it,

Sum of Value	Column Labels				
Row Labels	Domestic supply quantity	Export Quantity	Import Quantity	Production	Grand Total
Côte d'Ivoire	252	2067	2	2200	4521
Ecuador	-61	364	1	302	606
Ghana	2	961	2	822	1787
Indonesia	618	443	339	728	2128
Nigeria	-46	365	5	280	604
Grand Total	**765**	**4200**	**349**	**4332**	**9646**

Table 1 Data of cocoa for self-sufficiency calculation Source: (FAO, 2024)

After filter the variables that will provide the necessary information, it is possible to continue with the following calculation to find out the cocoa self-sufficiency presented in each country.

Country	Year	P	Z	SSR
Côte d'Ivoire	2021	2200	252	873%
Ecuador	2021	302	-61	-495%
Ghana	2021	822	2	41100%
Indonesia	2021	728	618	118%
Nigeria	2021	280	-46	-609%

Table 2 SSR Calculation Source: (own result)

In Table 2, it is possible to observe the results from the calculation made with self sufficiency ratio.

1.10 Liquidity Ratio

The first company consists of 'Golden Tree', a cocoa processing company limited (CPC). Golden Tree was established in 1965. It is divided into three factories: one confectionary factory and two cocoa factories. It was incorporated as a limited liability company in 1981. Furthermore, the company is also involved in the production of semi-finished products such as butter or cocoa liquor. In their products list are also included: chocolate bars, chocolate spread, drinking chocolate, and chocolate couverture.

Company	Golden Tree		
Country	Ghana		
Currency in the statement	US Dollars		
Assets	**Year 2021 / US$**	**Year 2022 / US$**	**Difference**
Non-current assets			
Property,Plant and equipment	$ 120,088,574	$ 114,290,527	$ 5,798,047
Current assets			
Inventories	$ 26,787,563	$ 17,673,939	$ 9,113,624
Current tax assets	$ 17,363	$ 19,299	$ -1,936
Trade and other receivables	$ 8,910,416	$ 4,933,760	$ 3,976,656
Prepayments	$ 435,188	$ 528,524	$ -93,336
Fixed deposit investments	$ 2,644,210	$ 2,707,841	$ -63,631
Cash and cash equivalent	$ 1,151,241	$ 810,458	$ 340,783
Total assets	$ 160,034,555	$ 140,964,348	$ 19,070,207
Liabilities			
Non-current liabilities			
Loans and borrowings	$ 33,556,428	$ 1,985,300	$ 31,571,128
Employee benefit obligations	$ 4,097,967	$ 2,871,650	$ 1,226,317
Deferred tax liabilities	$ 18,870,111	$ 17,899,918	$ 970,193
Current liabilities			
Bank overdrdaft	$ 1,192,653	$ 1,932,743	$ -740,090
Trade and other payables	$ 112,542,230	$ 47,317,579	$ 65,224,651
Loans and borrowings	$ 39,361,581	$ 46,763,057	$ -7,401,476
Total liabilities	$ 209,620,970	$ 118,770,247	$ 90,850,723

Table 3 Golden Tree Company, assets in US dollars (2021-2022) (Taken from picture 2)

Utilizing Table 3, it is possible to calculate the liquidity presented by the company 'Golden Tree' as the variables needed for its calculation which are assets and liabilities. As it was mentioned before, three formulas can calculate their liquidity: current, quick, and cash ratio. In this case, it will be used the current ratio to analyze the liquidity due to the information provided from the balance sheet.

$$\frac{Current\ assets}{current\ liabilities}$$

Formula 5 Current ratio

	2021	2022	Cash ratio
Current assets	$ 39,945,981	$ 26,673,821	1.50
Current liabilities	$ 153,096,464	$ 96,013,379	1.59

Table 4 Current ratio calculation for liquidity analysis of Golden Tree of 2021 and 2022 (own result)

Liquidity of FTN Cocoa Processors PLC

Assets	Year 2021 / US$	Year 2022 / US$	Difference
Non-current assets			
Property and equipment	$ 9,622,601,685	$ 9,445,277,595	$ 177,324,090
Available for sale financial assets	$ 488,142	$ 488,142	$ -
Other receivables	$ 1,799,802,334	$ 1,799,803,961	$ -1,627
Current assets			
Inventories	$ 606,669,386	$ 534,879,969	$ 71,789,417
Trade and other receivables	$ 56,782,305	$ 51,752,815	$ 5,029,490
Cash and equivalents	$ 21,839,473	$ 8,047,834	$ 13,791,639
Total assets	$ 12,108,183,325	$ 11,840,250,317	$ 267,933,008
Liabilities			
Non-current liabilities			
Borrowings	$ 13,901,346,927	$ 12,837,879,139	$ 1,063,467,788
Current Liabilities			
Trade abd other payables	$ 1,184,138,118	$ 1,297,696,218	$ -113,558,101
Borrowings	$ 124,619,398	$ 124,621,025	$ -1,627
Current taxation	$ 108,998,854	$ 109,504,895	$ -506,041
Total liabilities	$ 15,319,103,298	$ 14,369,701,278	$ 949,402,020

Table 5 FTN COCOA PROCESSORS PLC, conversion of assets into US dollars (2021-2022)(Taken from picture 3)

After the conversion from the Nigerian naira to American dollars, it is possible to proceed with the cash ratio calculation for a future analysis of the liquidity of FTN Processors during 2021 and 2022.

	2021	2022	Cash ratio
Current assets	$ 685,291,164	$ 594,680,619	1.15
Current liabilities	$ 1,417,756,371	$ 1,531,822,139	0.93

Table 6 Current ratio calculation for liquidity analysis of FTN Processors of 2021 and 2022 (own result)

6. Results and Discussion

1.11 SWOT Analysis

After a brief analysis of the production of cocoa, it is possible to conclude that the cocoa industry, despite it is difficult for the new entrants to stand out in the market, can be a perfect business considering the weather that can be beneficial to acquire a cocoa with high quality and taking into account that is a product that is consumed since long time ago. As a consequence, the production of cocoa is completely recommended due to the benefits it offers for the farmers that produce them and to the economic area of the country where this product is produced, as it generates an increase in the employment rate or some cases, as it was mentioned before, can be a positive impact in the tourist area leading an increase in the economical area.

In addition, it is necessary to emphasize the threats provided by the production of cocoa, as this research is focused on understanding the extent to which the production of cocoa is sustainable. The answer to this question is that the production of cocoa is mainly recognized for its lack of sustainability as a result of not having balance in the economic, ecological, and human well-being areas. Furthermore, the difference between both cocoas consists in their quality; in the case of 'Cacao Fino aroma' consists of cocoa recognized for it's high-quality; in contrast, the 'Ordinary or bulk' is known for being a low-cost cocoa and also considered production of them according to sustainability.

1.11.1 Cost of Production

According to the analysis made of cocoa costs of production, it is possible to understand that some costs can be reduced taking into account the specific regulations but there are some costs that everyone should consider in order to have a profitable result, this case could be evidenced in maintenance costs which explain also the necessary machines to make the production of cocoa and its process. Moreover, despite the production of cocoa is known for its lack of sustainability, this can be prevent and avoided taking the correct measure as it could be evidenced in the packaging costs, as something that maybe can looks so simple can actually create a significant impact in environment by taking advantage of the current technology to replace the packages that contain toxic components for sustainable ones, fulfil customers satisfaction, and being profitable. In addition, there could be some examples about how costs are evidenced in a developed country to give an idea to undeveloped countries about how costly

would be for them, as they will need more capital and economic support in case of new entrepreneurs and also give an idea about how extreme poverty is presented as a consequence of making wrong decisions just to save a small amount of money, but this can cause death and negative impacts in the families that have to face this situations.

1.11.2 Cocoa Self-Sufficiency

Taking into account that the self-sufficiency ratio indicates the domestic utilization of the commodity produced, in other words, the quantity that is consumed in the country that produces this commodity. Having this definition clear, it is possible to understand that being a country that is known for being the main producer of cocoa, doesn't mean that the consumers from that country can support their demand for this commodity; due to it, in the case of Ecuador and Nigeria, in Table 2, it shows that the percentage given is less than 100, so it means that in this countries, the cocoa produced is mostly for export purposes than for domestic utilization and having this situation, the people from this countries have to consume the import cocoa to reduced their necessity of consumption. It means, that the priority that these countries give to cocoa is for export purposes, because of this, during 2021 and 2022 Ecuador and Nigeria could be part of the list of the main exporters of cocoa, having Ecuador with $838M and Nigeria with $779M (*OEC, n.d.*).

Furthermore, in the case of the countries that have a percentage of more than 100, Cote d'Ivoire, Ghana, and Indonesia; despite their main priority of production of cocoa being for domestic consumption purposes, their production is more than enough to fulfill their domestic consumption demand and export the product, as they have a surplus of production. In case there would be a country equal to 100%, even though Indonesia was closed with an SSR of 118%, means that the country has the perfect balance, it means, without a deficit or surplus of cocoa production to support the demand of their domestic consumption.

1.12 Liquidity Ratio

According to Table 4, it is possible to find out that during 2021 and 2021 the cash ratio amount is more than 1, which means that this company counts with a strong liquidity position as it has more assets than liabilities, which means that Golden Tree can cover all its debts due to the belong of enough resources, and as a consequence, the company has a positive net worth, it means, demonstrate the value of the company. In other words, the company has the possibility of producing cocoa without having to experience any risk for doing so, and this also means that

the company can tackle all the requirements to produce cocoa and its cost of production, in addition, this results also shows the good management and administration of the company.

Moreover, in Table 8, it is possible to observe that during 2021, FTN Processors were able to manage a good administration and have strong liquidity as the value obtained from the cash ratio analysis is more than 1, and it means that during this year their assets were more than the liabilities they had, creating a positive net worth for the company. On the other hand, during 2022, the result obtained is less than 1, which means the company does not have the appropriate management of resources to fulfill their obligations such as debts, as a consequence, there is a negative liquidity for the company that can even affect its reputation because investors are mainly interested in the liquidity status of a company to be able to make their investments safely.

After a short analysis of liquidity between Golden Tree and FTN Processors, it was possible to demonstrate better management of resources from Golden Tree, as its liquidity is strong during both years and presents an increment of liquidity of 9%. Is it worth saying that this analysis is an advantage for investors as they can see the management and health of the company, in this case, they would prefer to invest in Golden Tree which presents an increment in their liquidity, instead of investing in FTN Processors that, in contrast, present a reduction of 23%.

7. Conclusion

Finally, it is possible to conclude that the production of cocoa is currently not sustainable as a consequence of not having a balance between economic benefits and not harming the environment. However, there are some options that producers can consider to improve its sustainability such as better distribution of their fertilizers or having better care for the trees by not exposing them to some chemics that can be harmful to them so they decide to plant more trees due to this situation and continue with deforestation. About hos costly the production of cocoa, was a challenge during the whole research due to the lack of information provided, and this can be a negative aspect for new entrepreneurs who are looking to produce cocoa but cannot obtain detailed quantitative information about it; as a consequence, it was possible to analyze its cost by a qualitative way taking into account all the variables that have to be included into the costs of production and having as an example a country that is developed, the United States, and as a developed country it also gives an idea for developing countries as they are stronger in their economies and can provide a high quality of life for its citizens; on the contrary, in case of undeveloped countries, due to its weak economy, the loses that can face are more as they depend mostly in the production of raw materials. It means, that in case of the countries that are undeveloped but are known for being the main producers of cocoa, can experience an economic underdevelopment. In addition to this investigation, it was provided a short analysis of the liquidation of two companies, one from Nigeria and the other one from Ghana, to have an example of the companies that produce cocoa and how the management of resources to accomplish their obligations such as the payment of debts, and this result that the company of Ghana, ‘Golden Tree’ present a stronger liquidity that ‘FTN Processor’ from Nigeria.

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9. List of pictures, tables, graphs and abbreviations

1.13 List of pictures

1.14 List of tables

1.15 List of Formulas

1.16 List of abbreviations

SWOT: Strengths, Weaknesses, Opportunities, and Threats.

FSS: Food self-sufficiency

SSR: Self-sufficiency ratio

FAO: The Food and Agriculture Organization

CCN-51: Colección Castro Naranjal 5

ICCO: International Cocoa Organization

Appendix

Financial Statements:

Golden Tree (Ghana)

STATEMENT OF
FINANCIAL POSITION
AS AT 30 SEPTEMBER 2022

Assets	Note	2022 US$	2021 US$
Non-current assets			
Property, plant and equipment	7	**114,290,527**	120,088,574
Total non-current assets		**114,290,527**	120,088,574
Current assets			
Inventories	8	**17,673,939**	26,787,563
Current tax assets	6(c)	**19,299**	17,363
Trade and other receivables	9	**4,933,760**	8,910,416
Prepayments	10	**528,524**	435,188
Fixed deposit investments	11	**2,707,841**	2,644,210
Cash and cash equivalents	12(a)	**810,458**	1,151,241
Total Current assets		**26,673,821**	39,945,981
Total assets		**140,964,348**	160,034,555
Equity and Liabilities Equity			
Share capital	16(a,b)	**26,071,630**	26,071,630
Deposit for share	16(e)	**87,000,000**	-
Revaluation reserve	16(c)	**53,113,126**	54,415,410
Fair value reserve	16(d)	**7,041,211**	11,732,644
Retained earnings		**(151,031,866)**	(141,806,099)
Total equity		**22,194,101**	(49,586,415)
Liabilities			
Non-current liabilities			
Loans and borrowings	14(b)	**1,985,300**	33,556,428
Employee benefit obligations	15	**2,871,650**	4,097,967
Deferred tax liabilities	6(d)	**17,899,918**	18,870,111
Total non-current liabilities		**22,756,868**	56,524,506
Current liabilities			
Bank overdraft	12(b)	**1,932,743**	1,192,653
Trade and other payables	13	**47,317,579**	112,542,230
Loans and borrowings	14(b)	**46,763,057**	39,361,581
Total current liabilities		**96,013,379**	153,096,464
Total liabilities		**118,770,247**	209,620,970
Total equity and liabilities		**140,964,348**	160,034,555

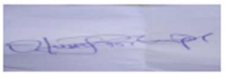
Picture 2 Financial Statement Golden Tree from Ghana

FTN Processors (Nigeria):

FTN COCOA PROCESSORS PLC
STATEMENT OF FINANCIAL POSITION
FOR THE YEAR ENDED 31ST DECEMBER 2022

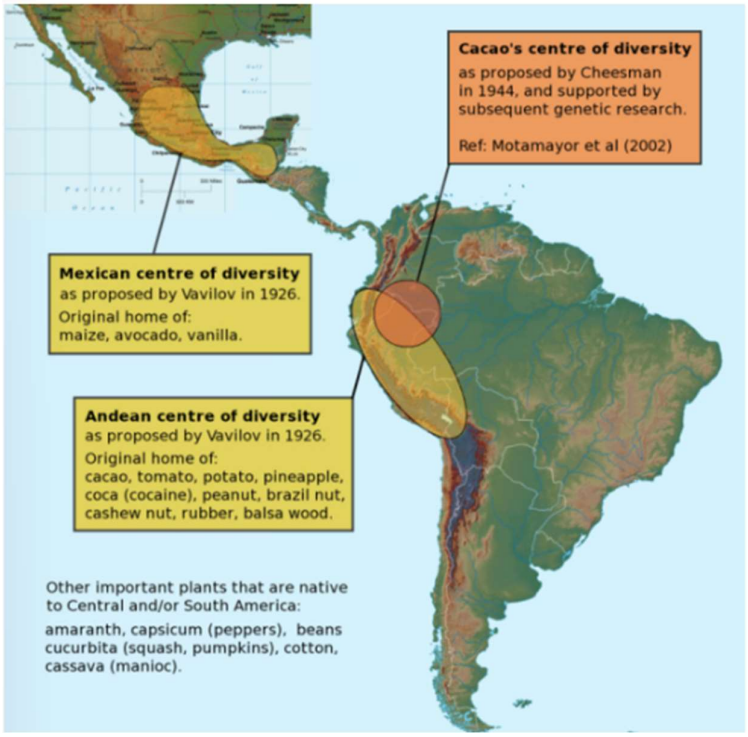
	Note	Q-T-D 31/12/2022 ₦'000	Y-T-D 31/12/2021 ₦'000
Non-current assets			
Property and equipment	5	5,804,833	5,913,813
Available for sale financial assets	6	300	300
Other receivables	7.2	1,106,115	1,106,114
Total non-current assets		**6,911,248**	**7,020,227**
Current assets			
Inventories	8	328,724	372,844
Trade and other receivables	7.1	31,806	34,897
Cash and cash equivalents	9	4,945	13,422
Total current assets		**365,475**	**421,163**
Total assets		**7,276,723**	**7,441,390**
Current liabilities			
Trade and other payables	10	782,679	714,891
Borrowings	11.1	76,588	76,588
Current taxation	12.2	66,988	66,988
Total current liabilities		**926,256**	**858,467**
Non-current liabilities			
Borrowings	11.2	7,824,198	7,334,521
Total non-current liabilities		**7,824,198**	**7,334,521**
Total liabilities		**8,750,453**	**8,192,988**
Equity:			
Share capital	14	1,950,000	1,100,000
Share premium	15	1,413,439	1,413,439
Revaluation reserve	16	4,017,369	4,017,369
Revenue reserve	17	(8,854,538)	(7,282,406)
Total equity		**(1,473,730)**	**(751,598)**
Total liabilities and equity		**7,276,723**	**7,441,390**

Mr. Akin Laoye
Managing Director
FRC/2021/003/00000023888

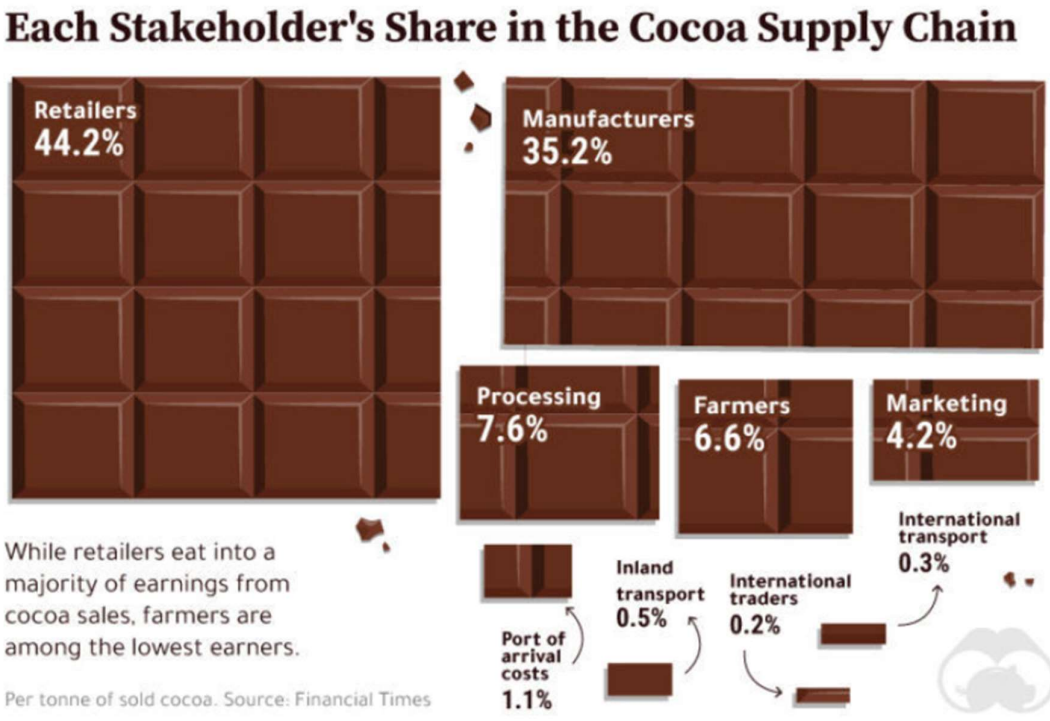


Mr. Olumayowa P. Jimoh
for: Chief Finance Officer
FRC/2022/PRO/ICAN/001/00000024076

Picture 3 Financial Statement of FTN Cocoa Processors from Nigeria



Picture 4History of cacao Source: (Goodnow Farms Chocolate, 2021)



Picture 5 Cocoa supply chain (World Economic Forum, 2020)